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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,748	01/24/2006	Burkhard Hahn	GK-OEH-219/500814.20121	2677

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EXAMINER	
ENTEZARI, MICHELLE M	
ART UNIT	**PAPER NUMBER**
2624	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,748	HAHN, BURKHARD	
	Examiner	Art Unit	
	MICHELLE ENTEZARI	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18 and 20* is/are rejected.

7)☒ Claim(s) *19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/24/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 11, 13, and 14 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 11, it is not explained what the "first selected frequencies" and "second selected frequencies" are. **Regarding claim 13,** it is not explained how the splitting is performed. **Regarding claim 14,** the significance of using the middle-frequency underfrequency for the comparison is not expressed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 11 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oktumi et al. (US 20060038891 A1) further in view of Fuchsberger et al. (4825297).

Regarding claim 11, Oktumi et al. disclose a method for reducing color moire in digital images (occurrence of false color suppressed, [0011], image is digital, [0041]) comprising the steps of: transforming the color signals of the image from an initial color space into a luminance channel and into chrominance channels of a luminance/chrominance color space ([0089]-[0094], [0127]) in which the luminance channel remains free of color signals that are transformed into the chrominance channels ([0089]-[0090]); performing an energy comparison (energy function takes into account correlation, [0099]), image point by image point (for each pixel, [0087]-[0088], and fig. 4 and 5), between the luminance channel and the chrominance channels (correlation characteristics between luminance and chrominance, [0099]) that is limited

to first selected frequencies (filtering, [0130]-[0135]) in order to determine pixels in which color moire is present (suppress generation of false color, [0127], change cut-off frequency to prevent over-smoothing, [0135]); making a correction of the energy values of the pixels in which color moire is present (parameter u adjusts a relative significance between spatial and spectral energy, [0081], coefficients in transformation can be corrected, [0098], false color can be suppressed, [0135]) in at least one of the chrominance channels (motion estimation applied to at least one color channel, [0117]), which correction is limited to second selected frequencies (filtering, [0130]-[0135]). It is noted that the Oktumi et al. reference does not explicitly disclose doing the correction on a different set of frequencies than the first, however, as written, the claim does not indicate these frequency ranges need be mutually exclusive.

Oktumi et al. do not disclose transforming the corrected color signals of the chrominance channels and the color signals of the luminance channel back into the initial color space.

Fuchsberger et al. teach transforming an RGB signal to YUV (col. 4, lines 55-65) and then transforming the corrected color signals of the chrominance channels and the color signals of the luminance channel back into the initial color space (col. 5, lines 5-15).

It would have been obvious at the time of the invention to one skilled in the art to improve the method of Oktumi et al. with the well known transformation back as taught

by Fuchsberger et al. for the predictable outcome of consistency between input and output color space. These transformations are well known in the television art (Fuchsberger et al., col. 1, lines 60-65).

Regarding claim 20, Oktumi et al. and Fuchsberger et al. disclose the method according to claim 11.

Oktumi et al. further disclose the steps in claim 11 are applied multiple times ([0151]-[0152]).

2. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Oktumi et al. (US 20060038891 A1) and Fuchsberger et al. (4825297) as applied to claim 11 above, further in view of Saito (US 7227552 B1) and Hunter et al. (US 7006686 B2).

Oktumi et al. and Fuchsberger et al. disclose the method according to claim 11. Oktumi et al. and Fuchsberger et al. also disclose the motion estimation is applied to the green channel ([0117]).

Oktumi et al. and Fuchsberger et al. do not disclose the RGB color space, where R is red, G is green and B is blue, serves as initial color space from which the transformation into the luminance/chrominance color space is carried out in that the green color signal

is transferred unchanged to the luminance channel, and the chrominance channels r and b are formed by r = R/(R + G + B) and b = B/(R + G + B).

Saito shows for a color balance adjustment operation (abstract, col. 5, lines 55-60), that RGB image data is converted to rgb space represented by:

$$r=R/(R+G+B)$$

$$g=G/(R+G+B)$$

$$b=B/(R+G+B)$$

Before color balance adjustment processing commences. (col. 5, line 65- col. 6, line 10).

It would have been obvious at the time of the invention to one skilled in the art to improve the method of Oktumi et al. and Fuchsberger et al. with the well known rgb channel representation as taught by Saito for the predictable outcome of mapping with a simple arrangement that corresponds to human visual characteristics, (Saito, col. 2, lines 20-35).

Hunter et al. teaches a demosaicing of color images (abstract) in which the green derived pixels will always remain unchanged (col. 9, lines 55-65).

It would have been obvious at the time of the invention to one skilled in the art to improve the method of Oktumi et al., Fuchsberger et al., and Saito with the well known

process of leaving green unchanged as taught by Hunter et al. for the predictable outcome of more efficiency, as there are twice as many green elements as red or blue (col. 1, lines 15-20), so it will already have more detail (col. 1, lines 65-68).

3. **Claims 13-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Oktumi et al. (US 20060038891 A1) and Fuchsberger et al. (4825297) and Saito (US 7227552 B1) and Hunter et al. (US 7006686 B2) as applied to claim 12 above, further in view of Enomoto (US 20020196472 A1).

Regarding claim 13, Oktumi et al., Fuchsberger et al., Saito, and Hunter et al. disclose the method according to claim 12.

Oktumi et al., Fuchsberger et al., Saito, and Hunter et al. do not disclose splitting the frequencies into high, middle, and low frequencies for each channel.

Enomoto teaches for the chromatic aberration correction system ([0001]), signals are separated into high-, medium- and low-frequency components ([0189], [0217]).

It would have been obvious at the time of the invention to one skilled in the art to improve the method of Oktumi et al., Fuchsberger et al., Saito, and Hunter et al. with the well known process of leaving green unchanged as taught by Enomoto for the predictable outcome of allowing gain for the high-frequency components and the gain

for the medium-frequency components are changed for the R, G and B image data either uniformly or independently of one another ([0213], [0217]), which gives the operator more control over the processing.

Regarding claim 14, Oktumi et al., Fuchsberger et al., Saito, Hunter et al., and Enomoto disclose the method according to claim 13.

Because Saito teaches g = G/(R+G+B) (col. 5, line 65- col. 6, line 10), this indicates a ratio of energy of the middle frequency to the sum of low, middle, and high frequencies.

Regarding claim 15, Oktumi et al., Fuchsberger et al., Saito, Hunter et al., and Enomoto disclose the method according to claim 14.

Enomoto further teaches the gain M is preferably set in such a way that the medium-frequency components R_M, G_M and B_M (luminance component Y_M) which involve the coarseness due to the graininess of the film are not unduly enhanced, and graininess is suppressed, and high-frequency components R_H, G_H and B_H (luminance component Y_H) which involve the edges and fine texture of the image are enhanced ([0196]). This indicates correction of the energy values of the pixels in which color moire is present is limited, as a reduction of energy values, to the middle-frequency second underfrequency range in at least one chrominance channel, as the medium frequency components are not enhanced.

Regarding claim 16, Oktumi et al., Fuchsberger et al., Saito, Hunter et al., and Enomoto disclose the method according to claim 15.

Oktumi et al. further disclose an attenuation factor that is linked to the energy comparison measurement serves to reduce energy values, as f3(z) is the spectral energy ([0081]), and to correct an image, the coefficients can be corrected ([0098]). Oktumi et al. further discuss the minimization of f(z) (i.e. reducing energy values) ([0110]). Weighting parameters are also discussed ([0131]-[0133]).

Regarding claim 17, Oktumi et al., Fuchsberger et al., Saito, Hunter et al., and Enomoto disclose the method according to claim 16.

Oktumi et al. further disclose the attenuation factor corresponds to the energy comparison measurement of the luminance channel (f3(z) corresponds to spectral energy, [0081]).

Regarding claim 18, Oktumi et al., Fuchsberger et al., Saito, Hunter et al., and Enomoto disclose the method according to claim 15.

Oktumi et al. further disclose an empirically determined constant serves as attenuation factor for the energy value reduction (weight is determined by detecting edge direction and intensity, [0131]).

Allowable Subject Matter

1. **Claim 19** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

2. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. US 20040155983 A1 Topper, Robert J.

b. US 7023576 B1 Jonsson; Michael et al.

c. US 7221381 B2 Brown Elliott; Candice Hellen et al.

d. US 4642678 A Cok; David R.

e. US 6958772 B1 Sugimori; Masami

f. US 5768403 A Suzuki; Yuzuru et al.

g. US 7065246 B2 Xiaomang; Zhang et al.

h. US 6697109 B1 Daly; Scott J.

i. US 4498100 A Bunting; Richard M. et al.

j. US 5502509 A Kurashita; Takuji et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHELLE ENTEZARI whose telephone number is (571)270-5084. The examiner can normally be reached on M-Th, 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michelle Entezari/

Examiner, Art Unit 2624
/Brian Q Le/
Primary Examiner, Art Unit 2624